

CLAIMS

We claim:

1. A method for designing small molecule compounds for solubilizing amyloid protein comprising:
 - creating a combinatorial library of compounds possessing at least two chemical domains selected from a peptide-like domain, a melatonin-like domain and a nicotine-like domain, and
 - screening the combinatorial library for compounds that bind to and solubilize amyloid protein.
2. The method of claim 1 wherein the compound comprises a peptide-like domain, a melatonin-like domain and a nicotine-like domain.
3. The method of claim 1 wherein the compounds bind to the helix-loop-helix structure of amyloid protein.
4. The method of claim 3 wherein the compounds bind non-covalently to amyloid protein.
5. The method of claim 1 wherein the compounds in the combinatorial library are created by solid phase synthesis.
6. The method of claim 1 wherein the compounds have a binding energy with amyloid protein of between 1 and 20 kcal/mol.
7. The method of claim 6 wherein the binding energy is between 5 and 15 kcal/mol.
8. The method of claim 7 wherein the binding energy is between 7 and 12 kcal/mol.

9. The method of claim 8 wherein the binding energy is 8 kcal/mol.
10. The method of claim 1 wherein the compound comprises a melatonin-like domain and a peptide-like domain wherein
the melatonin-like domain is covalently bonded to the N-terminus or C-terminus of the peptide-like domain.
11. The method of claim 10 further comprising covalently bonding a nicotine-like domain to the peptide-like domain or the melatonin-like domain
12. The method of claim 11 wherein the melatonin-like domain is covalently bonded to the N-terminus of the peptide-like domain and
the nicotine-like domain is covalently bonded to the melatonin-like domain.
13. The method of claim 11 wherein the melatonin-like domain is covalently bonded to the N-terminus of the peptide-like domain and
the nicotine-like domain is covalently bonded to the peptide-like domain.
14. The method of claim 1 wherein the compound comprises a nicotine-like domain and a melatonin-like domain or a peptide-like domain wherein
the nicotine-like domain is covalently bonded to either the melatonin-like domain or the peptide-like domain.
15. The method of claim 14 wherein the nicotine-like domain is covalently bonded to a melatonin-like domain.
16. The method of claim 14 wherein the nicotine-like domain is covalently bonded to a peptide-like domain.

17. The method of any of claims 1-16 wherein the compounds are useful for treating symptoms of Alzheimer's disease.

18. A composition made by the process of designing small molecule compounds for solubilizing amyloid protein comprising:

creating a combinatorial library of compounds possessing at least two chemical domains selected from a peptide-like domain, a melatonin-like domain and a nicotine-like domain, and

screening the combinatorial library for compounds that bind to and solubilize amyloid protein.

19. The composition of claim 18 wherein the compound comprises a nicotine-like domain, a melatonin-like domain and a peptide-like domain.

20. The composition of claim 18 wherein the compound comprises two chemical domains wherein the chemical domain is a nicotine-like domain, a melatonin-like domain or a peptide-like domain